

## CLAIMS

What is claimed is:

1. A clamping unit for use in an injection molding machine, comprising:
  - a plurality of tie bars symmetrically positioned and mounted in parallel to corners of a front platen and a rear platen; a movable platen movably sleeved about the tie bars and positioned between the front and rear platens;
  - a servo-motor mounted on the rear platen, for providing power for operating the clamping unit;
  - a belt-gear mechanism associated with the servo-motor, for transmitting torque force and turning speed provided from the servo-motor;
  - a ball screw transmission mechanism including a ball screw and a guide device connected to the belt-gear mechanism, for converting the torque force transmitted from the belt-gear mechanism into axial pushing force, wherein the guide device is formed with a threaded hole for allowing the ball screw to be inserted through the threaded hole;
  - a toggle linkage mechanism for interconnecting the rear platen and the movable platen, and bearing the axial pushing force from the ball screw transmission mechanism so as to drive the movable platen to move along the tie bars.
2. The clamping unit of claim 1, wherein the belt-gear mechanism includes an active gear, a passive gear and a belt.
3. The clamping unit of claim 1, wherein the guide device is sleeved about one end of the ball screw, and a connector device is affixed to the other end of the ball screw,
4. The clamping unit of claim 3, wherein the connector device is peripherally formed with at least a front bearing device, and the guide device is surrounded by

at least a rear bearing device, so as to allow two ends of the ball screw to be firmly supported for stable operation.

5. The clamping unit of claim 2, wherein the guide device of the ball screw transmission mechanism is coupled to the passive gear of the belt-gear mechanism, and driven to rotate by the servo-motor in association with the belt-gear mechanism, so as to induce the ball screw to move forward and backward, and convert the torque force from the servo-motor into the axial pushing force, which is in turn transmitted to the toggle linkage mechanism for driving the movable platen to move along the tie bars.
6. The clamping unit of claim 2, wherein the belt of the belt-gear mechanism is a timing belt, which is precisely toothed and engaged with the active gear and the passive gear for power transmission.
7. The clamping unit of claim 1, wherein the toggle linkage mechanism includes driving arms having one ends thereof pivotally connected to the ball screw transmission mechanism, and the other ends thereof pivotally linked to joints of front arms and rear arms, which front and rear arms are pivotally associated with the movable platen and the rear platen, respectively.
8. The clamping unit of claim 4, wherein the front and rear bearing devices each is formed with a bearing.
9. The clamping unit of claim 3, wherein the ball screw is fixedly mounted with the connector device by means of a nut.